building and sustaining a learning environment for inclusive design

A framework for teaching inclusive design within built environment courses in the UK

Final Report of the Special Interest Group in Inclusive Design
for Centre for Education in the Built Environment

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Elaine Ostroff: Founding Director of Adaptive Environments, Boston Massachusetts, USA. She is also responsible for the Global Universal Design Educator's Network. Appendix A: Examples of inclusive design approaches in built environment education is based on her paper 'Strategies for teaching and recruiting Designers for an Inclusive World', given at the Scientific Contact Forum, Brussels, Belgium June 2002. The section has been updated with some additional UK based information.

Andrew Shipley: from the Disability Rights Commission kindly allowed us to refer to and draw on his discussion paper ‘What is Inclusive Design and how can it achieve a built environment to be enjoyed by everyone?’ arising from the November 2001, DRC Round Table Discussion on inclusive design which involved over 50 experts from Scotland, England and Wales.

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Background and Context to the Report

Inclusive Design has been taught and researched in the UK in various guises across the built environment for several years, but it has been a dispersed activity dependent on the dedication of a few individual champions.

The work of those individuals involved in inclusive design has often been better known at international rather than national level, so funding was sought with the aim of bringing together a small but representative group, to compare and identify common strategies and resources for teaching inclusive design. The resulting funding from the Centre of Education for the Built Environment allowed this special interest group on inclusive design to meet at regular intervals over a twelve month period, between Sept 2001 and Sept 2002.

The initial group was extended to incorporate interested parties from other built environment disciplines to ensure a broad representation. And in line with the ethos of inclusive design, representatives from two user groups; disabled people and women, took part in the discussions that led ultimately to the production of this document. The aim was to ensure a process that was both informed and inclusive.

Who could use this document

This document is aimed at encouraging the integration of an inclusive design approach into built environment courses. Hence it is primarily for those who create, coordinate and teach on such courses. In addition, the following bodies and individuals will also find the document informative.

Within the Built Environment Professions:

> The Professional institutes who represent and regulate the built environment professions, particularly those institutes that validate courses in higher education which lead to entry into their profession.

Outside the Built Environment professions:

> Consultancy organisations and groups that represent the interests of different user groups in society, Government organisations, Statutory

Agencies, Housing Corporations and Research councils. In particular those who are responsible for commissioning in the built environment.

Points of departure

The document takes as one of its starting point the Tomar Resolution ResAP (2001) 3, on the Introduction of the Principles of Universal Design into the Curricula of all Occupations working on the Built Environment, which was adopted by the Committee of Ministers of the Council of Europe on the 15 February 2001. This six page resolution was the first formal attempt to stimulate Europe wide reaction to the concept of universal design, and its introduction into vocational, further and higher education built environment courses.

This document provides a more detailed response to the Tomar Resolution, by identifying the key factors to the practical integration of inclusive design.

At another level, this document is driven by the concern that despite the 'natural' logic of inclusive design, its mainstream adoption in the curricula of built environment courses remains limited. Where it does occur, it is mostly at postgraduate level. Examples of undergraduate course do exist, but they are usually driven either by external funding and have a short lifespan or by the concerted efforts of one individual and are typically poorly disseminated.

Aims of the document

In addition to contributing to the growing sources of information on inclusive design, this document aims to stimulate debate around inclusive design and particularly its teaching in higher education. It is hoped that by making the nature of inclusive design more explicit, connections to other areas of concern in the built environment, (such as sustainability, health and safety, access for disabled people etc), can also be drawn and built upon.

This document also aims to create a framework for teaching inclusive design rather than a curriculum. It is felt that even within courses with similar profiles, the variation in teaching approaches, management support, and curriculum focus, etc. will be such that establishing a standard inclusive design curriculum would prove impossible. (Welch and Stanton 2001)

The document exposes the extent, content and consequences of applying inclusive design principles. It is hoped, that in this way those responsible for existing courses can place their course within this framework and alter, add or simply make aspects of their teaching more explicit to ensure a closer fit to inclusive design principles.

Ultimately, the aim is to ensure that inclusive design principles are taught as an integrated part of built environment courses and not as an add-on.

Thoughtful use of the framework document should ensure that a new generation of built environment professionals will be educated to apply inclusive principles, contributing to the creation of new inclusive environments and the removal of environmental barriers within existing contexts.

Section 1: Introduction to Inclusive Design

"No new architecture can emerge without a new kind of relation between designer and user, without new kinds of programs. (Kenneth Frampton 1983)

Inclusive Design- one of many terms

Inclusive design is one of many terms currently in use in built environment professions, the building industry, and in the wider arena of local and central government. It shares a similar background and has similar aims to many other terms such as universal design, design for all, lifespan design, and most recently, 'respect for people' and designing for diversity. (Glossary of terms see Appendix B)

The term universal design originated in the USA. It initially grew out of the disability movement, but in time came to mean designing for all people. It became formalised in 'Seven Principals of Universal Design' drawn up by a working group of architects, product designers, engineers and environmental design researchers. The Council of Europe's Resolution ResAP(2001)1on the introduction of the principles of universal design into the curricula of all occupations working on the built environment, which was adopted by Council of Ministers on 15 February 2001, clearly also uses the term universal design whilst at the same time saying:

"For the purpose of this resolution the terms "integral accessibility", "design for all" and "inclusive design" are understood to have the same meaning as the term "universal design", which is used in this text."

Most recently and closer to home, the RIBA (Royal Institute of British Architects) in its 'Criteria for Validation' and ARB (Architects Registration Board) in its 'Prescription of qualifications' have adopted the phrase 'universal design for access'. The meaning of this hybrid term is however not defined.

Despite the RIBA and ARB's choice of terminology, 'inclusive design' is overwhelmingly the term of preference for those who already teach and research in this area in the UK. There is shared belief that inclusive design is better suited to the UK context and value system. The UK Institute of Inclusive Design actively promotes inclusive design and most recently (Oct 2002) the Helen Hamlyn

Research Centre and the Design Council have created a new inclusive design education resource web site that illustrate inclusive case studies:

www.designcouncil.org.uk/inclusivedesign .

'Inclusive design' responds to the concern that the term 'universal design' can be misleading, suggesting that it seeks 'universal solutions' to problems which meet the needs of all people. In fact some of those known for their strong advocacy of universal design in the USA have recently declared a preference for the clarity of the term 'inclusive design' (Steinfeld, Tauke 2002)

The intention, however, is not to spend time making distinctions between the various terms, nor to declare one better than the other, but rather to draw and build on related work, regardless of the terminology used, in order to support and illustrate the arguments for and information about inclusive design education.

Definition and premise of inclusive design

Inclusive Design is a process that results in inclusive products or environments which can be used by everyone regardless of age, gender or disability.

(adapted from Shipley 2002)

It is however an evolving and complex concept, whose definition can be extended to address not only age, gender and disability, but also race, income, education, culture etc… .

It is useful to supplement this open ended definition with an understanding of the basic premise, which lies behind inclusive design and its consequences,

that is:

> the built environment can exclude and discriminate against certain groups in society at certain times.

This premise means that inclusive design begins not only from an aspirational standpoint (i.e. designing for all), but also a critical one.

In order to find new ways to create and maintain environments that cater for the needs and desires of all people, we must also understand what has prevented us

from doing so in the past. This critical position ensures that we are better able to address any obstacles or shortcomings that exist in our processes and skills; obstacles that may potentially prevent even the most willing and knowledgeable professionals from creating and maintaining inclusive environments.

Inclusive design relies on a holistic and sustainable understanding of the responsibilities, of those who shape the built environment in relationship, to those who populate it.

Section 2: Why teach inclusive design?

Inclusive design is becoming a significant theme at National and European levels and its influence is growing. This section however looks at some of the more pressing reasons why inclusive design should be integrated into the curriculum of built environment courses.

The moral argument

Sternberg argues: “If universities taught wisdom, there would be more emphasis on the values underpinning everything that we do.”

Inclusive design is essentially a value based process, which takes as its premise the fact that everyone has a right to participate in community life. Consequently, a powerful argument to support the importance of teaching inclusive design, is the need to assist students in the development of their own set of values to underpin their future practice as built environment professionals. Inclusive design can fulfil this important function. It is clear that teaching students to administer technical codes or interpret legislation for equal rights is an important part of the preparation of a student for professional practice, but this approach without the philosophical underpinning is unlikely to result in an inclusive environment. (Lifchez, 1986)

Over the last few decades academic and professional discourses have provided substantial weight to the argument that society has created a disabling environment for many people (Oliver, 1990). This, in turn, has lead to the wide spread realisation that society has a responsibility to remove obstacles to equal participation for all people and avoid the creation of new disabling environments. (Davis, 1993) However, within the context of built environment education, the strongest and clearest moral argument to teaching inclusive design is that an inclusive environment is a fundamental human right.

The sustainable argument

A sustainable environment is one that supports a sustainable society or community. Built environments which are inaccessible or exclude people lead to isolated and poorly interconnected communities. Such communities have been shown to require more external support and resources. Community sustainability

is best achieved through the creation of inclusive environments, which combine flexible, usable and adaptable building forms with long term affordability and access to services. Such environments encourage neighbourhoods to evolve and flourish, by supporting and facilitating change, growth and responsiveness to changing needs of built environment users. Flexible, “organic” environments, which grow with their communities, are less likely to become redundant or abandoned. These sustainable environments will enable and encourage interaction and socialisation with others in the surrounding community as well as with other communities elsewhere.

Inclusive environments allow people to exercise choice, integrate and participate, regardless of their age, ability, gender, etc. A community rooted within a more inclusive environment finds it easier to develop both formal and informal networks. Inevitably this results in a balanced, healthy, less resource-hungry and thus sustainable community.

The professional argument.

"How ethical is it to practice architecture- to be professional licensed to design buildings and places of assembly - without having first developed an intellectual and emotional understanding of people?" - Lifchez

The substance of the moral argument has been embedded in the codes of conduct of many built environment professional institutions. Standard 5 of the Code of Practice produced by the Architects Registration Board, for example states:

“In carrying out or agreeing to carry out professional work, architects should pay due regard to the interests of anyone who may reasonably be expected to use or enjoy the products of their own work.”

Similarly, the codes of practice of other professional institutions, such as the Royal Institution of Chartered Surveyors (2001), the Royal Town Planning Institute and the Institute of Civil Engineers, make it clear that their members should operate both within an equal opportunities framework, and have a sense

of responsibility for the way in which their professional actions impact on both clients and users of the built environment.

Ultimately, a professional is defined and shaped as much by their integrated ethical approach, as they are by their skills and knowledge.

The economic argument

Put simply, where an environment is inclusive, it allows more people to access it, work there, pay taxes and buy consumables and services. Built environment professionals have a duty to show their private and public sector clients that inclusive design offers benefits that directly affect long-term profitability, consumer relations and corporate reputation.

This is well illustrated in Imrie's case studies of retail and leisure centres, where "the cost/economic factor included the spending potential of disabled people, but also developers' perception of the need to be inclusive." Nussbaum reinforces this:

"..the corporation as an institution and the market place as a whole is neither 'good' nor 'bad' per se. They are motivated by profit, not morality. Thus the most [effective] way of including all differently abled people is to persuade corporations to design their products and services so that much larger numbers of people can use them, thereby increasing their profits."
Bruce Nussbaum (2001)

In this approach to inclusive design, students can be encouraged to demonstrate to their clients, how designing inclusively can be seen not as a burden, but as an opportunity to expand markets and increase business profitability. However, in spite of this, it is evident that many people still associate inclusive design with extra costs. There is some evidence that it may have an implied cost, but equally there are case studies, where inclusive design has cost more in the short term but cost less in the long term by increasing profitability through decreasing life time management costs. Ultimately, the discussion comes down to whether the long-term value of an environment has priority over its short term cost. (See Appendix C for cost versus value examples.)

It is worth being aware that there are other financial incentives to designing inclusively. Many funding bodies such as Design Council, National Lottery, Research Councils (EQUAL –extend quality of life), CABE etc, have begun to embed the concept of inclusion into their aims and funding criteria. There seems to be a general trend toward the situation, where any project that attracts central government funding will only be successful, if the project demonstrates exemplary practice in relation to inclusive design.

Furthermore, there are many disadvantages associated with failing to design inclusively. These can include the cost of bad publicity associated with poor design solutions, the creation of hard to let buildings and poor economic viability, the costs associated with the need to undertake remedial works and even the costs of litigation. In addition, there are costs associated with providing care or support to people who are unable to/ can no longer use these environments independently or safely. For example, a recent study into the effect of incorporating Lifetime Homes standards into new housing today (Brewerton and Darton, JRF 1997) showed that any additional capital costs would be outweighed by savings – through the reduced need for temporary residential care and home care support – equivalent to £248 for every new dwelling built between 1996 and 2025.)

Taking a wider view, it is important that built environment professionals have an appreciation of the impacts on society of failing to create a more inclusive environment. Lack of inclusion for many groups, including disabled people, but also embracing such groups as single parent families and members of ethnic minority groups, can lead to high levels of poverty, sickness and benefit dependency. It is difficult for the economically active population to support this level of dependency. When this situation is considered in the light of the increasing proportion of elderly and retired people in the population, the problem of providing for these groups is compounded. (Coleman, 2001)

Perhaps the question should be not, *how can we afford an inclusive environment?* but rather, *how can we not afford to provide for inclusion and participation in the economic life of the nation?*

The legal argument

Laws that embrace and safeguard health and equality have increased in number over the last 30 years. The built environment, which provides the context for our lives, is framed as much by its hard physical edges and the aims of individuals as it is by legislation.

Legislation such as the acts that address race, sex and disability discrimination, Health and Safety, SENDA (Special Educational Needs and Disability Act 2001) , Building Regulations, Approved Document M in England and Wales, and recommendations such as BS 8300 are all focused on protecting the civil rights and welfare of those who make, use and maintain the built environment. The impact of such legislation is already beginning to greatly affect the nature of the built environment.

In particular, the Disability Discrimination Act 1995, although yet to be fully realised, has the potential to have a far-reaching impact on the work of built environment professionals. The basic aim of the legislation is to end any form of discrimination against disabled people, and this includes discriminatory practice in the design and management of built environments. The legislation, which will be fully in force by 2004, is different from the familiar codes established under the Building Regulations. Although it has been severely criticised by disability groups, it has a foundation based on inclusion as a basic human right. Furthermore there is an expectation that the nature of that right will develop over time. This changing expectation is primarily because the Act specifically rests on the legal interpretation of the nature of what is “reasonable”, in terms of achieving an inclusive environment. For the designer of a new building, for example, this uncertainty can be viewed as an irritant or an design opportunity. Adherence to a precise code based on technical specifications, sometimes provides a sense of security and removes fear of litigation for the professional. Although Codes of Practice, BS standards and Building Regulations will continue to provide some degree of security, it is evident that the precise nature of what is reasonable under the legislation will evolve over time, as the courts interpret the legislation and social attitudes about the nature of reasonableness in themselves move on. As a consequence, the role of the built environment professional will be not only to keep abreast of changing views of what is regarded as reasonable and advise

his or her client accordingly, but also to act as a leader of changing public opinion about what is possible in terms of improving levels of inclusiveness.

The important point to glean from the new legislative situation is that the climate is changing to one where simply meeting minimum standards will not be good enough. The built environment professional will need to be equipped to move the construction industry as a whole into a new era of design quality, based on inclusive design principles.

Section 3: A fuller understanding of inclusive design

Inclusive design is not just about designing for disability and ageing. It has, however, benefited from having strong links to designing for disability and ageing in a number of ways. Experience has shown that meeting the needs of disabled or elderly people, frequently generates design solutions which benefit a wider range of user groups, such as young children or people with prams, heavy luggage, temporary injuries etc. Educationally, many of the teaching methodologies developed to address disability and aging, form the basis of inclusive design teaching. It is also widely recognised that teaching inclusive design through disability is an effective way of revealing the range of highly individual and common experiences of the built environment.

But the focus on disability and aging has also led to a number of preconceptions which have prevented inclusive design from being encompassed fully into design education and culture. The association with physical access or the needs of elderly or disabled serves to marginalise what is characterised as a specialist and rather bland aspect of design. It is easily dismissed as an item on a checklist to be ticked off and resolved by the adoption of universal solutions or specifications. It is thought that responsibility for considering these issues rests with the designer, rather than with all of those involved in the commissioning, designing, building and management of the built environment. Rarely is it considered as an integral part of creating places of character and quality.

But if the aim is to create environments that are “attractive, safe, uncluttered and work effectively for all in society” (DETR 2000), then such preconceptions have to be challenged and a far wider remit and sense of responsibility for designing inclusive environments has to be demanded.

Choice

Choice is what really defines inclusive design. Inclusive design is tasked with meeting the challenge of providing not only accessible environments, but spaces where choice is equally available to all. Gaining access is just the first step along the road to acquiring choice.

Health and Safety

Inclusive design addresses the needs of all who populate the built environment, not only the consumers, but also those who construct, maintain and service it. Inclusive design education therefore reinforces an understanding of health and safety concerns and their consequences on the construction, design and management of the built environment.

Participatory design process

Inclusive design processes are invariably participatory and multi professional. They extend from initiating the brief, designing, and construction, into the processes of feedback and post occupancy evaluation of the completed environment. These, in turn, influence the maintenance and management of that environment and any future adaptations or additions required. Inclusive design education must provide students with knowledge and skills in brief making, participatory methods and environmental auditing.

Promoting an inclusive ethos

Those who brief designers, offer consultancy, build, manage, maintain and service their designs are all inextricably bound into the process of achieving and maintaining inclusive environments. Responsibility does not rest solely with the designers of the built environment, but with the whole project team and the professionals that surround them; for example, quantity surveyors, project managers, contractors and site operatives, service engineers, planners, developers and planning supervisors; in fact anyone who makes a decision or acts in a way that creates, alters or influences the nature of the built environment. Students therefore need to acquire team working and cross-disciplinary skills to promote an ethos and awareness of inclusive design.

A cultural attitude

Inclusive design goes beyond the remit of architecture, landscape architecture and urban design. It is an attitude that needs to be promoted, for example, in all aspects of the planning of the built environment including the structuring of its transportation systems, location of facilities such as hospitals, schools and surgeries or places of employment.

Design quality

The aim of inclusive design is to create an environment that provides for all people and excludes no one, and clearly not to the exclusion of design quality. It not only demands imaginative and innovative responses to everyday problems, it also needs to be considered at every stage of the design process; as an opportunity for, rather than a limit to, creative design.

In the past, there has been an emphasis on finding universal solutions, but it is unlikely that one universal solution will meet the needs of all people. It is also undesirable. One of compelling reasons given by the Urban Task Force as an explanation of why urban design standards have fallen so far in this country, is "the imposition of generic solutions that fail to understand local character or involve local people" (CABE 2001). Inclusive design cannot afford to make the same mistake whatever the scale or context.

Some solutions have a wide application, for example the plastic lids for coffee beakers that avoid hot spills for car drivers and are fun for children, were originally designed for people with limited muscular control. Seeking universal solutions has a role at a strategic level to increase aspiration levels and gain support from a wide range of people. But inclusive design also needs to look at specific solutions for specific user groups. In doing so, it can generate detailed, practical solutions, which set standards that over time can be improved on or integrated into broader knowledge.

Raising awareness and extending skills

Inclusive design education must address what the professions value, how they view their professional roles, the responsibilities they adopt, and importantly, the skills they apply.

To a large extent, it has been a lack of knowledge of people's needs that has resulted in excluding or discriminating environments. But it is also due in part to the profile of the built environment professions; traditionally white, male and middle class. It is a group, which is usually able to overcome any environmental constraints they personally experience and has limited contact with those, who struggle to access the built environment.

It is obviously critical, to add to existing knowledge of peoples needs, but it is also important, to raise awareness as to just how much consideration of these issues can make a difference to the quality of people's lives. It is only when this is recognised that inclusive design will become embedded in practice. The challenge is, to explore and question the values held by design professionals; to encourage them to be aware of different needs and expectations. There is now a growing realisation that the knowledge and values needed to create and maintain inclusive environments, have in turn to be supported by a more extensive set of people orientated skills than built environment professionals currently utilise.

Section 4: Key elements for success

"Are there distinct learning methodologies and core skills that can be taught to all students on built environment courses, in order to enable them to sustain an inclusive design approach?"

(Research question taken from original CEBE funding application, 2001)

This section grew out of the CEBE Special Interest Group's initial research question and the discussion generated within the group. This section identifies and examines the key elements that lead to success when teaching inclusive design. It draws on the experiences of the members of the group and on the published descriptions and analysis of universal and inclusive design education projects from a variety of countries; USA, Ireland, Norway, Canada, Australia, Japan etc. (Lifchez 1987, Welch 2001, Welch 1995, Morrow 1998, Morrow 2001, Pedersen 2001, Christopherson, 2002, Ostroff 2002.).

The section is divided into two parts: course content and course context.

Part 1: Course Content looks at seven elements, covering knowledge, skills and values. Part 2: Course Context examines five elements concerned with the surrounding pedagogical context. Each element is listed in the table that follows, and a fuller explanation is provided in the following pages.

It is recognised that not all situations or courses may allow for the full implementation of each and every one of the elements discussed here. The hope is that by setting them out in this way, educators can identify which they already address, which areas may need only slight adjustment and which require new or additional input. The more elements implemented the better. But experience shows that often the simple act of making existing elements of a course explicit, or stating the connection or relevance to inclusive design, is sufficient.

Part 1: COURSE CONTENT

Part 2: COURSE CONTEXT

COURSE CONTENT

The interrelationship between design quality, best practice and inclusive design are drawn and emphasised

Where inclusive design is understood as simply the functional response to people's needs, and the limit of those needs is defined by legislation or codes of practice, the results are sterile, lifeless environments. When the design process is limited in this way, the design professions see it as a threat to 'good' design, where the results are worthy but aesthetically dull.

"This dangerous misconception about client accommodation as antithetical to creative expression can be dispelled by teaching students how to be client - conscious and make beautiful buildings at the same time." (Lifchez 1987)

One of the most important tasks of inclusive design education, within built environment design courses, is to reconnect real-life problem solving to innovative design solutions. Inclusive design is a complex process, and it's this complexity that can sometimes put pressure on the creative process, depressing aesthetic achievements. Students need plenty of opportunity to practice and reflect on their creative skills within inclusive design context, both within project work and design studies.

Through early and repeated exposure, students develop positive and sustained creative responses that can address even the 'realest' of problems. They come to realise that inspiration does not always have to come from an abstract source, but can arise just as readily from responding laterally to an everyday situation. Resolving real life problems is a very potent and creative challenge.

Students come into direct contact with a varied range of user groups.

Beginning with Raymond Lifchez's work in Berkeley, California (Lifchez, 1987) and more recently, extensively demonstrated in the Universal Design Education Project (Welsh 1995) and the Norwegian UDEP (Christopherson 2002) , putting students in direct contact with a wide range of users, is understood as the foundation stone of inclusive design teaching.

“The faculty found that engaging user consultants in the classroom and studio was the single most valuable strategy for teaching universal design.” (Welsh 1995)

Student cohorts in built environment courses in the UK tend to have similar profiles, i.e. they are predominantly young, non-disabled, healthy, male and white; therefore it is vital that when they think of users, they do not simply make reference to their own needs and experiences, i.e. act in their own image.

Much work has been done in order to devise various learning experiences that allow for the development of, not only an understanding of, but crucially, empathy with the user. (Aldersey-Williams 1999).

(Note: in the context of inclusive design the user is not just those, who visit or occupy the built environment, but also those, who build, manage and maintain it.)

The range of methods acknowledges that bringing students directly into contact with users is often problematic. Organising large student cohorts, issues of personal privacy when meeting and talking to users, and the lack of funds to compensate people fairly for their time, are only some of the problems.

Simulation exercises which ask the students to role-play or to take on some of the physical characteristics of the user, are frequently used. However, particularly where such exercises have been used to simulate disability, there is much criticism of its long-term affect on the attitudes of those taking part and on its accuracy of providing a full picture of the user. (French 1996)

Firstly, anyone carrying out a simulation exercise will have no ‘coping’ strategies to deal with the disability, and is therefore plunged into a completely different experience to the one a disabled person will have on a daily basis. The person, experiencing the simulation, will tend to be overwhelmed by the "novelty" of the unfamiliar situation. In contrast, an older person or a disabled person will not be concentrating on the experience per se, rather the activity of getting on with their daily life. In addition, the older person or disabled person will have developed ways of doing things that best suit them. People, who use a wheelchair for the first time, will not have the fine control over manoeuvring that someone who uses a wheelchair on a daily basis will have. A person, who is visually impaired, clearly

has a much better understanding of the stimuli that surround them, than someone who has just put on special goggles to blur their vision.

Secondly, a person involved in a simulation exercise will eventually finish the exercise and return to their daily life. They have little chance of experiencing the relentlessness of both the physical and attitudinal barriers that an older or disabled person experiences. Thus, unless the tutors facilitating the learning experience are familiar with and are able to discuss these shortcomings of simulations exercises with the students, they are probably best avoided.

Observing and listening to people is also an obvious method that imparts greater knowledge of user needs. Representatives of different user groups can be invited into the 'classroom' to give presentations or alternately, students can be sent out to observe individual people in their work, home or leisure environments. However, effective observation and listening requires good communication and analysis skills, since there is a danger that students misinterpret what they see or hear.

Representing and acting as advocate follows on from observing and listening. Students are asked to use the knowledge they have gained, in order, to represent the interests of those users they have observed e.g. they might play the user's advocate whilst reviewing other students work. This is similar to the use of paraphrasing when teaching students good listening skills.

Working directly with users is seen to be the most effective method of building strong levels of empathy, personal understanding and knowledge. The relationship between the built environment student and the user becomes even more successful, when it is a relationship built on equality and interaction. This allows students to develop positive attitudes to previously marginalised user groups and helps them to overcome stereotypical views of, for example, disabled people or ethnic minority groups. Instead of seeing difference as a problem or something to overcome, they start to value diversity as a natural part of the human condition.

In addition, working with users offers a good opportunity in a course to discuss professional responsibilities, to all those involved in and using the built environment.

Students are able to source and apply quantitative and qualitative information regarding the fit between humans and the built environment

This involves both the hard and 'soft' (subjective) data that exists about the relationship between humans, as individuals and as part of a societal group, to the spaces they populate.

Students need to have knowledge of such areas as:

- Current best practice in technical specifications, e.g. turning circles of wheelchairs, gradient for approaching a highway.
- Key facts and figures regarding changing profiles and needs of people and society; ranging from statistical breakdown and incidence of impairments, changing profile of population to the implications of physical, social, cultural needs etc
- The relationship of body to space- senses, movement, and the variances in different bodies.
- Awareness of the contradictory spatial needs between different individuals and groups.
- Wayfinding needs and skills. E.g. legibility, sense and memory of space.
- Information about barriers in the built environment, gained from space audits. Developing auditing skills.
- The factors affecting the perception of space, the question of socialization of people within the built environment and what makes them feel comfortable, safe, connected, threatened etc.

The difficulty with such knowledge is that it is extensive and detailed. Students need to have both knowledge management and research skills to obtain the most current information form primary and secondary sources. But they also need to understand that this knowledge is in constant flux, since the spatial needs of different groups in society and our understanding of it, is constantly being

revised. In addition, the needs of different groups or individuals are often in conflict. The example most commonly used are curb stones, which act as a barrier to wheelchair users, but help to guide long-canes users. This reinforces inclusive design as a process of negotiation. There is often more demand for conflict resolution skills and a need for phased compromises, than immediate solutions

Students are encouraged to develop inclusive methods of communication and representation.

Consultation, collaboration and participation are key elements in inclusive design education. Inclusive design relies on inclusive forms of representation. The traditional forms of representation used in built environment professions have been developed, to represent the formal and organisational qualities of space. They are, by necessity, both abstract and 'profession specific'. However, those outside the profession find it difficult to offer formative feedback to the process. Inclusive design draws on the knowledge and input of everyone who uses the built environment, not simply for egalitarian reasons, but because long after a building's use has changed and the designer's conceptual ideas have faded, it is people’s experience of the space that persists.

This is a particular important issue for architecture courses. The drawings, that architecture students produce, rarely convey how accessible (physically, perceptually, psychologically etc) the spaces are, at a detailed level. Design drawings are used to represent almost exclusively the layout, sequence and dimension of space. Detailed construction drawings, on the other hand, illustrate the sequence of construction and materials specified. Alongside these two types of drawing is the need for an accessible method, which communicates the physical nature and human scale of space.

The benefit of bringing users into the formative assessment of projects is that it naturally leads to students finding ways to communicate in accessible and inclusive ways.

The pragmatics of inclusive design are supported by a theoretical and critical framework.

Inclusive design is part of a broader body of critical theory that surrounds the built environment and its professions. It is argued that an important aspect of inclusive design is its effectiveness to act as a critical filter, when examining the built environment, the culture that surrounds it and the pedagogy that supports it. (Steinfeld 2002, Morrow 2001).

Inclusive design has close alliances to feminist and sustainable theories, and needs therefore to be incorporated into the wider and more general critical discourse around the built environment. This is imperative if, as Welch says, it is to 'move from the margins into the heart of curricular development', avoiding the perception of being an add-on or a specialism. In turn, this positioning within the broader theoretical discourse helps individual students, who on entering the professional world, find their inclusive approach misunderstood and unsupported by existing work practices. Having an understanding of inclusive design and its relationship within contemporary critical contexts, better equips students for such cultures of resistance. It helps them cope strategically with the sources of frustration, rather than becoming overwhelmed by the symptoms.

Personal experience is valued and positive attitudes towards all people in society are fostered.

Inclusive design asks that the personal experience of all individuals involved should to be valued. This includes not only users of the built environment, but that of the students. Tutors need to acknowledge and build on the student's personal experiences and prior knowledge of the built environment. This is in opposition to traditional models of education, where students are viewed either as 'empty vessels' or 'slates to be wiped clean'. Inclusive design teaching draws on the students' previous experiences as users of the built environment and supports them, in making reference to this. As Franck says "exploring ones subjectivity can be a path to understanding the experience of others". Such personal experiences might however be also a source of personal bias, so any course with an inclusive design approach needs to examine the stereotypes and prejudices that exist in all of us as individuals and in society as a whole. This area of teaching brings many challenges. It needs a learning environment that

creates trust and non-defensiveness, to allow students to change and alter language and behaviour that might be inappropriate (Adams 1997). Social justice education offers inclusive design a strong model for this type of teaching.

Students are fully aware of reasons to engage with inclusive design.

See Section 2: Why teach inclusive design

COURSE CONTEXT

Inclusive design principles are integrated from an early stage and are a substantial part of the curriculum.

Inclusive design can only be truly effective, if it is integrated at all levels of design, theoretical, technical and professional studies. It impacts on all aspects of the course; from understanding how to construct an accessible threshold, to the implications on how to meet and work with people, to how different cultures exhibit different ways to resolve their spatial needs etc..

Along with the breadth of knowledge surrounding inclusive design, there are skills that need to be acquired and practiced from an early stage to ensure that an inclusive design approach is successfully maintained and developed. Skills such as team working, learning how to meet and listen to inclusive briefing skills, accessible representational skills, environmental auditing etc. All of these need practice and development over time, so the sooner a reiterative learning process starts for students, the better.

Built environment courses tend to employ a range of teaching situations: seminars, lectures, design studios, and workshops. Again it is important that inclusive design is integrated and fundamental part to all aspects of the teaching and not consigned to a ‘add-on’ lecture in a lecture series.

Courses adopt an interdisciplinary and multiprofessional approach.

As discussed earlier, inclusive design is about more than just design. It is the responsibility of all of those involved in the chain that briefs, funds, designs, builds, provides products for, manages and maintains built environments. Each of the players must be clear about their own role, but must also be clear about their connection and responsibility to professionals. This ensures that an environment, which is designed and built to be inclusive, is managed in an inclusive way across its life span. Hence, it is important that courses provide, as far as possible, an interdisciplinary and multi professional learning environment. At the very least students should develop strong team working skills and understand their role in the team.

Inclusive design is supported by alternative pedagogies and explicitly valued by appropriate modes of assessment.

"The teaching of a value as complex and pervasive as universal design is not accomplished simply by adding a lecture, assigning a reading, or teaching "the code" . Design instructors have found that to affect attitudinal change, the pedagogical strategies must be at once engaging and critical"
Welch, Jones (2001)

Inclusive design teaching relies on a mixture of alternative and traditional pedagogical practices.

As discussed earlier, students have traditionally been viewed as passive players in the learning process. Inclusive design teaching requires the personal experience and background of the student to be acknowledged and brought into the course discussion.

The teacher's role becomes finely balanced between facilitator and director, much as an inclusive practitioner's might be. Their expertise lies less in the extent of their own knowledge and more in being able to help students identify and utilise the sources of knowledge appropriate to inclusive design.

In order to imbed and legitimise an inclusive design approach within a course, the input must naturally be valued through explicit and appropriate methods of assessment. There are two important concerns when adopting an inclusive design approach:

Firstly, that the process is evaluated as fully as the product. The earlier discussion in Section 1 illustrated how part of the product of an inclusive approach is itself the process.

Like many professionally orientated courses, built environment courses inevitably judge their students against the model of the complete professional and their product. Whilst this has a certain validity, there is a danger that the system implicitly encourages students to produce, what

looks like a professional product, before developing the necessary skills and knowledge to build an inclusive process.

Teachers need to utilise methods of assessment that are able firstly to access the student's process and then assess it. Learning journals, where students are asked as part of their course work to describe their process, are a good example of such methods.

Secondly, since inclusive design education calls for students to be exposed to a range of users, this exposure must continue into the assessment process.

Teachers are occasionally uncomfortable with involving users in the evaluation process. They are concerned that users will not understand the academic aims of project work and consequently give conflicting or confusing advice to students. This can be avoided by making a distinction between summative (i.e. giving a mark) and formative assessment (i.e. giving feedback) and involving users only in latter. Any subsequent differences between the teachers' and the users' perception of a student's project can then form part of the project dialogue and learning.

Confident and able professionals who can meet the challenges of inclusive design need to be aware that their role and products can be valued in different ways, at different times, by different people.

Continuing Professional Development (CPD) is understood as essential to sustaining good inclusive design practice.

Inclusive Design is a developing area. We know more now about the barriers within the built environment, than we knew 20 years ago. But it is clear that there are still barriers as yet unidentified, and indeed, more to know about the impact of those we are aware of, on people's lives. In addition, an understanding of user groups shows us that different groups and individuals can often have not only contradictory but also directly conflicting needs. There is frequently more demand for conflict resolution skills and a need for phased compromises, than immediate solutions. With society's perception of what is acceptable constantly changing over time, inclusive design gradually reveals itself to be highly complex.

It is not an area that can be easily mastered; instead it requires continuous, open and respectful dialogue to keep knowledge and skills up-to-date and relevant.

Inclusive design education needs therefore to instil an ethos of continuous learning in those all concerned. It needs to encourage them to develop good research and self directed study skills and more importantly, present CPD (continuing professional development) as a prerequisite for professional practice.

Courses are delivered by people who are fully aware of inclusive design principles

Most teaching staff, in common with current practitioners, have themselves been educated to regard designing inclusively as a desirable, but worthy “special needs” provision and not a fundamental part of the design of the built environment. Consequently, the knowledge of many staff is confined to a rather vague appreciation of technical codes and, as Lifchez has stated, technical specifications alone cannot create an inclusive environment (Lifchez, 1987).

There is also a tendency for some built environment professionals to fail to make the connection regarding the way their own profession’s work affects inclusiveness. For example, the architect may be seen as a responsible person in terms of the accessibility of buildings by some professionals, but the role of the planner, urban designer or highway engineer in achieving an inclusive street, neighbourhood and city may be ignored. The importance of inclusive design may be lost to the holder or manager of financial resources or the quantity surveyor, whose decisions may have huge consequences for the nature of the finished environment. Furthermore, the influence of the professions involved in the management and maintenance of the environment will often be forgotten.

This all points to the need for CPD for academic staff, since unless the inclusive approach is accepted as a guiding philosophy, it is likely that new generations of built environment professionals will continue to be educated in a way that fails to consider inclusive design. This clearly requires a paradigm shift in current pedagogical approaches. A major challenge that needs to be addressed is educating the educators.

Section 5: Report Conclusion

The members of this special interest group in inclusive design see this document not so much as a completed and definitive piece on the teaching of inclusive design within built environment courses, but rather as a document that marks the beginning of a process. Its chief purpose therefore has been to momentarily frame the group's discussions and identify methods of further dissemination, discussion and research.

This final section reflects on the dissemination activities arising out of the project both within and beyond its lifetime and proposes future actions and activities to promote inclusive design.

Dissemination activities during the project

November 2001:

The group made a written response to the draft document 'tomorrow's architect, RIBA criteria and outline syllabus for the validation of courses, programmes and examinations in architecture. One outcome has been the use of the phrase 'universal design for access' for the first time in the criteria for validation. Although neither the choice nor positioning of the phrase within the document are to the group's preference, the group sees it as a beginning.

March 2002:

SIG group members invited to present an outline of the group's work to DPTAC's (disabled peoples transport advisory committee) education and training committee.

The group also established links to and exchanged information with two other inclusive design education projects running in Europe.

> Belgium: where an EU sponsored project aims to provide a framework for structural integration of the principles of universal design in the curriculum of the various programs for design. The departments of design sciences at HA (Antwerp), and the departments of architecture at Wenk

(Ghent/Brussels) and PHL (Hasselt/Diepenbeek) are involved. Contact Herbert Froyen, Ghent.

Denmark: where an EU sponsored research project "Aaoutils", aims to develop a "tool box" of teaching methods for teaching UD/design for all at design and architecture schools. Contact: Camilla Ryhl, royal academy of fine arts, Copenhagen.

May 2002.

SIG group members gave a presentation on their activities to the universal design education forum, Brussels organised by the European Institute for Design and Disability.

Dissemination activities following the project.

31st October 2002.

Urban Summit 2002. Three SIG members will be presenting some of the groups outcomes in the form of a 1.5 hour workshop at the fringe event to the summit

7th November 2002.

DPTAC (disabled peoples transport advisory committee) education and committee. Two SIG members have been invited to give a presentation of the final outcomes of this project to this government advisory body.

30th November 2002.

International conference on universal design (inclusive design), Japan. Two SIG members will be presenting a paper based on the SIG groups outcomes.

9th -11th April 2003.

International conference on building education and research. Two SIG members will be running a workshop at this conference on the themes of inclusive design education.

Future strategies for wider influence

One of two research questions that this special interest group originally posed itself was:

What strategies can be identified for ensuring that the concept of inclusive design reaches not just a wider audience but an influential one that will effect and maintain the adoption of inclusive design across built environment education?

The group concluded their series of meetings and discussions by identifying key actions that they felt were required in order to further the progress of inclusive design. These actions fall into three categories

1. Specific actions that draw directly on the outputs, skills and knowledge of this special interest group and CEBE resources.

2. General actions that require input from other bodies in order to affect progress and change and

3. Future Research.

1. Specific actions

The CEBE website.
This is a useful and appropriate site for dissemination. The group believed some of the text from this document would be particularly appropriate and accessible for the CEBE website. It was felt that those visiting the website would be looking specifically for:

- A definition of inclusive design,
- The arguments for teaching it and
- Some examples.

These areas are currently contained within section 1, section 2 and Appendix A in this document and can be delivered as finite packages to CEBE before Jan 2003.

CEBE workshops

Workshops would provide an excellent opportunity to disseminate the groups work and to engage in discussion directly with those involved in teaching built environment courses. The content of such workshops would incorporate the information put out on the CEBE website but would also specifically address the question: *What happens when you teach inclusive design?* Workshops would draw on section 4: key elements for success. They would allow staff to prepare for any eventual difficulties and yet also discover potential benefits and overlaps to their existing teaching content and methods. These workshops can be offered and promoted through CEBE and staffed by those who have taken part in the sig.

Future publications:
CEBE funding has been successful in allowing this group to come together, but ultimately the SIG members would still like to see a revised version of this document published as a whole. The aim is therefore to identify potential funders and publishers over the coming months. In addition to this, members of the group will continue to seek publication of any papers given at the events listed earlier.

2. General actions

Although many of those people teaching on built environment courses may have heard of inclusive or universal design, the majority of them will consider it as a 'content issue'. For some, this will be addressed simply by identifying the content that needs to be taught and adding it in or on. For the less positive, however, this is tantamount to curriculum creep and their resistance will be marked.

However as seen in section 4: key elements for success, inclusive design affects not only the content of a built environment course but also, and more significantly, the pedagogical context. Without changes in teaching methodology, new content will not 'take hold', and it is this that needs to be brought to the urgent attention of those responsible directly and indirectly for built environment courses.

To do so we need to

- Utilise the current surge in interest towards inclusive design, and build strong alliances to other areas that are calling for similar pedagogical changes in built environment education e.g. sustainable design, affordable design, etc.
- Disseminate effectively to those responsible for built environment courses, in a joint conference with other interest groups that call for change. This involves both educating the educators and informing the professional institutes.
- Widen dissemination activities and extend influence; not just to those teaching on built environment courses but to a wider audience of policy makers and standard bearers- to those working in built environment professions and the building industry and to those giving employment to the building industry and its professions.

3. Future research

The SIG members identified areas and examples of future research projects which would help to establish a wider context for inclusive design and hence extend its influence.

The research projects fall into the following areas, examples of projects are given:

Inclusive design and the built environment:
Project example : to establish the socio political position of inclusive design and its relationship to the built environment, construction industry and current modes of procurement.

Inclusive design and 'design'
Project example: to examine the link between inclusive design and 'good' design in the built environment.

Inclusive design and built environment education
Project example: to generate and disseminate more UK based case studies of inclusive design teaching in education, in particular in undergraduate built environment courses. Successful models for such funded pedagogical projects already exist in the USA and Norway (universal design education projects).

Inclusive design and theory

Project example: to re-examine and catalogue the work of some of architecture's most 'iconic' architects for positive examples of designing for people. Not only on practical levels of physical access but also for social, psychological, cultural accessibility. The hypothesis is that such examples exist but have rarely been analysed or described in inclusive ways.

Appendix A: Examples of inclusive design approaches in built environment education

This section lays out the most significant examples of inclusive / universal design teaching from around the world. The table contains a short description and quick references. A longer description of each example with references is given after the table.

Early examples	
Raymond Lifchez, University of California, Berkeley, USA, 1973	A.1
Jim Sandhu, Royal Polytechnic Institute, London, England, 1972	A.2
UK examples	
Graduate Diploma in Environmental Access, Architectural Association School in London, led by Andrew Walker. See Chapter 1.6 Development Towards Inclusive Design Teaching in Universal Design 17 ways of Thinking and Teaching. Husbanken. 2002 To order book see http://www.husbanken.no/	A.3
MSc Inclusive Environments. University of Reading. This is a multi-professional post-graduate programme for those involved in design and management of the built environment http://www.rdg.ac.uk/ie/Courses/MSc.html	A.4
Distance taught, online programmes in accessibility and Inclusive Design, University of Salford. These online, accessible programmes include a postgraduate certificate, postgraduate diploma and master of science and are multiprofessional. http://www.scpm.salford.ac.uk/surface/courses.htm	A.5
BA (Hons) in Architecture and Planning, University of the West of England. This is an undergraduate course in architecture and planning which imbeds inclusive design throughout the course. See “Putting People First: Designing an Inclusive Curriculum.” At http://www.udeducation.org	A.6
First Year Architecture Course, University of Sheffield This is a first year architecture course that uses inclusive design as a one of the guiding principles of the design studio.	A.7
Helen Hamlyn Research Centre, Royal College of Art The HHRC website at http://www.hhrc.rca.ac.uk/ is a frequently updated and in-depth source of information on the Centres programmes and work.	A.8

USA examples	
Universal Design Education Project (UDEP) Described in Welsh, P., Ed. (1995). Strategies for Teaching Universal Design, Adaptive Environments, Boston Massachusetts. An online copy of this book can be found at the Adaptive Environments Website at: http://www.adaptiveenvironments.org/udep/index.php	A.9
The Department of Architecture, University at Buffalo. This department has much experience of teaching universal design and has imbedded it in many of their (traditional and online).programmes. Their teaching has been well disseminated. They also have a research centre 'inclusive design and environmental access (IDEA) centre, the website of which can be found at: http://www.ap.buffalo.edu/idea/	A.10
USA Websites	
The Universal Design Network, is the home of the Global Universal Design Educators Network and monthly Online News. This can be found at http://www.universaldesign.net	A.11
Universal Design Education Online website at http://www.udeducation.org is intended to support the teaching and study of universal design. It also provides a place where educators can interact with each other.	A.12
The Seven Principles of Universal Design. A working group of architects, product designers, engineers and environmental design researchers, collaborated to establish the following Principles of Universal Design to guide a wide range of design disciplines including environments, products, and communications. These seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments. http://www.design.ncsu.edu/cud/univ_design/princ_overview.htm	A.13
Norway	
The Norwegian Universal Design Education Project organised by the Norwegian State Housing Bank (Husbanken)	A.14
Ireland	
The DraWare Project. This was a pedagogical research project that sought to imbed inclusive design both within the school of architecture at university College Dublin and the architectural profession. A detailed description can be found at the DraWare Website http://www.avc.ucd.ie/DraWare and also in the Universal Design Handbook.	A.15
Denmark	
The AAOutils Design for All Project (a pan-european project based in Belgium, Denmark, France and Poland. Website found at http://anlh.be/aaoutils	A.16

Japan	
NEC Corporation Collaboration with Tama Art University	A.17
Canada	
Sheridan College, Teaching Architectural Technologists See http://www.udeducation.org/teach/course_mods/T/topping.htm	A.18
Universal Design Institute, University of Manitoba	A.19
Australia	
University of Western Australia : Good example of introducing diversity (in this instance mostly cultural diversity into a design studio) through an inclusive pedagogic practice. For references see Chapter: 'Designing Cultural Futures at the University of Western Australia' in Universal Design Handbook and Chapter 3.1: Introducing Universal Design to a Colonial Context in Universal Design; 17 ways of thinking and teaching.	A.20
Sweden	
UDEP Project in Sweden	A.21
Belgium	
Inclusive design project in Belgium	A.22

Early Examples

A.1: Ray Lifchez, 1973, University of California, Berkeley, USA

Ray Lifchez began a way of teaching architecture by involving users in the traditional design studio as a way to introduce students to the opportunities of designing for someone unlike themselves.

Lifchez's work is well documented. His book, Rethinking Architecture, chronicles and evaluates the studio from several perspectives. There is also a video, A House for Someone Unlike Me, that illustrates the lively interactions in the architectural design studio.

Professor Lifchez describes the origins of his teaching, "My personal interest and involvement in the disability movement dates to my arrival in Berkeley in 1970. The number and variety of people using wheelchairs immediately struck me. I was told that Berkeley was the 'crip capital' of America. The facts about Berkeley soon emerged: the history of its new, original institutions, such as the Center for Independent Living (CIL), created by young people with physical disabilities...the accumulated knowledge about such subjects as how to make houses accessible...and how to achieve better health and personal dignity through nonmedical practices. Alongside this thriving subculture was the University of California, committed to making higher education accessible to physically disabled students." (Lifchez, R. 2002)

"As an architect and a new professor at the university, I volunteered to help with plans to facilitate access...At that time, I was assigned a large undergraduate studio course in architectural design. The objective of the course was to teach design skills within a framework of social issues, to give beginning students a social awareness that would lead them to create accommodating designs...Gradually, I began to invite some of my disabled friends to visit the design studio to talk about the students' work. They observed and commented on whether or not they could live in the buildings the students were designing. These occasional visits became, eventually, a part of the studio curriculum."

Ray believes that this is a way for students to become very aware of all users - older people, people with disabilities, children. “It is not just about access,” he says. “It is about the relationships between all users. People with disabilities are 'super environmental professionals' who in their everyday lives deal with the complexity of the physical environment. They have an enormous amount to teach the students.”

References:

Lifchez, R. 1987. *Rethinking Architecture: Design Students and Physically Disabled People*. Berkeley, CA: University of California Press.

A House for Someone Unlike Me (1984). Written and produced by Bruce W. Bassett for the National Center for a Barrier Free Environment. Video, 38 minutes. Available from Adaptive Environments Center, 374 Congress Street, Suite 301, Boston, MA 02210, (617) 695-1225 (v/tdd) ext. 29.

Lifchez, R. 2002. “Introduction.” In Ostroff, E., Limont, M. and Hunter, D. *Building a World Fit for People: Designers with Disabilities at Work.* Boston, MA: Adaptive Environments Center (forthcoming).

A.2: Jim Sandhu, Royal Polytechnic Institute, London, England, 1972

Sandhu, in recent correspondence describing the course that he created at the Royal Polytechnic Institute said, "The Design for the Non-Average Course operated within the Diploma Course. It was so new that it could only be an option - but an option that counted towards their grade. At that time students fell into two clear categories: the caring type who opted for the course, and those who thought it was a waste of time for budding go-getting architects."

A course description that he wrote explained, "The aim of this option is to generate information, clarify and develop concepts, methods, and team and personal involvement in theoretical research and practical design projects. We shall examine the relationship between the design process and the built environment from the viewpoint of a range of users - those with special needs and those who are average."

Upon reflection, Sandhu said, "The course had the option of studio work or some extended essay/thesis. The most outstanding studio project resulted in a practical flatpack cardboard house which was cheap, easy to construct and very versatile. The cardboard was something called 'Triwall,' strong and light. It started with an effort to meet student-housing needs and then opened up for emergency housing for the majority world, using concrete or adobe on the outside. The wide publicity for the two students who designed the folding house had a big impact on those students who thought the course a waste of time...The fact that I was not a trained architect but an industrial designer (amongst other things) was the biggest hurdle by far."

References:

Sandhu, J.S. An Integrated Approach to universal design: Towards the inclusion of all ages, cultures and diversity. In *Universal Design Handbook*. Eds W.Preiser and E. Ostroff, McGraw-Hill, USA. 2001.

Sandhu, J.S. Multi-Dimensional Evaluation Tool in Teaching Universal Design. In *Universal Design; 17 ways of thinking and teaching*. Ed Jon Christophersen, Husbanken, Norway, 2002.

UK Examples

A.3: Graduate Diploma in Environmental Access at the Architectural Association School in London

Andrew Walker developed and directed this Post-graduate course in Environmental Access at the Architectural Association in London. It was the first qualifying certificate from any institution in the world. Andrew is an architect who is expert in historic renovation. After his accident on a project he began teaching at the Architectural Association and became head of Technical Studies.

The aim of the post-graduate program was to bring together those involved in planning, designing, building, and using environments. The course was multi-disciplinary. People who were directly affected by a disabling environment in terms of gender, race, and disability were naturally included as students, educators and innovators. Many of the students came on a work-release program from their design offices. The students were very involved in real-world problems.

References:

Walker, A. Development Towards Inclusive Design Teaching in Christophersen, Jon., Ed. *Universal Design 17 ways of Thinking and Teaching*. Husbanken, Norway, 2002.

Ostroff, E., Limont, M. and Hunter, D., *Building a World Fit for People: Designers with Disabilities at Work*. Boston, MA: Adaptive Environments Center 2002

A.4: MSc Inclusive Environments. University of Reading

This is post-graduate programme for those involved in design and management of the built environment for all users. The programme is focused on examining the needs and addressing the issues faced by all users, including those with a sensory impairment, physical disability or learning difficulty. It also allows non-construction professionals to study construction and transport related areas they are often required to address, but for which they currently receive little formal training. The multi-professional approach of this programme allows the providers of environments to be fully aware of the capabilities and needs of all users and, in turn, for users and those who assist them to experience the problems faced by the providers.

A.5: Distance taught, online programmes in accessibility and Inclusive Design, University of Salford4.

The Programmes are facilitated by SURFACE, (Salford University Research Focus on Accessible Environments) which is a Centre of Excellence within the School of Construction and Property Management. All members of the SURFACE team have a direct experience of disability and their wide range of life experiences is reflected in the course material.

Students are drawn from a range of backgrounds, such as building control officers, planners, architects / technicians, access officers, health authority managers, voluntary sector, local access group members, occupational therapists, DDA enforcers, etc.

Modules include: Design in the Built Environment, Designing for Accessibility and Inclusiveness, Construction and Legislative Processes, Access Auditing and Inclusiveness, Research Methodology and Thesis.

The programme is studied over the internet in a fully accessible learning environment. The students meet for an induction session and a summer school, but otherwise study in the comfort of their own home or work environment with access to study material 24 hours a day. Tutor support is provided on-line via email and telephone. Disabled students who have previously been excluded for the higher education framework are encouraged to apply through an assessment

of prior experiential learning. They are encouraged to share their experience with non-disabled students.

A.6: BA (Hons) in Architecture and Planning, Putting People First: Designing An Inclusive Curriculum, University of the West of England.

Sandra Manley, who drew up the course at the University of the West of England (UWE), Bristol, explains its development on the Universal Design Education Online website. Much of the following text is excerpted from her description.

This is the first undergraduate degree in the UK to combine architecture and planning in one degree, and extensive consultation was used in the design of the curriculum. It was planned in collaboration with the key architectural and planning organizations in the United Kingdom including the Royal Institute of British Architects (RIBA), Architects Registration Board (ARB) and the Royal Town Planning Institute (RTPI). The program is unique in the seamless way that universal design is meshed with cultural values and sustainable design. These concepts are infused throughout the four-year program. “This consultation had revealed that although it was considered important by professionals from both groups to raise the level of design competence in the planning profession it was an equally valid aim to raise the architectural professions understanding of planning and particularly social and environmental issues. The importance of designing directly to meet people’s needs was a major consideration…

To achieve these aims the course team adopted three words, namely People, Context and Sustainability to act as the key themes of the course. The intention was to try to avoid the simplistic view sometimes adopted by students on modular courses that once an aspect of the curriculum has been taught and assessed it can be dismissed from the mind. Instead each theme would permeate the course. This did not mean that particular modules would not concentrate on teaching knowledge and skills relevant to each theme but it did mean that the key issues would be reoccur for consideration throughout the course.

The people theme broadly corresponds with the principles of a universal or inclusive approach to design. The aim is to ensure that students will constantly be reminded of the importance of the issue of designing to meet the needs of a wide range of clients and users by infusion of the theme throughout the course.”

Manley is the joint leader of the course design team. The course has had preliminary monitoring and a report is available.

References:

Manley, S. “Putting People First: Designing an Inclusive Curriculum.” At http://www.udeducation.org

Manley, S. “Creating an Accessible Public Realm.” In Preiser, W.F.E. and Ostroff, E. (Eds.) *Universal Design Handbook*. New York: McGraw-Hill.

Manley, S and Parnaby, R. 2001. “Putting people first: comparing vision and reality in the architecture and planning course at UWE.”

A.8: Helen Hamlyn Research Centre, Royal College of Art

The Helen Hamlyn Research Centre (HHRC) is a vibrant leader in inclusive design research, design competitions, and practice in the UK as well as the international scene. Established in 1999 with core funding from the Helen Hamlyn Foundation to improve the lives of older people, the Centre builds on a long history of social engagement at the Royal College of Art (RCA). In describing the origins of the HHRC Roger Coleman, co-director of the HHRC notes that the RCA has a long-standing interest in social issues. “In 1976 it staged the Design for Need conference, which brought practitioners from around the world to London…Subjects ranged from ecology, environmental policy and the recycling of materials, to self-build housing, workplace design, designing out disability, equipment for emergencies and disasters, and beyond that to design education in developing counties.” He described the thrust of the conference as a “shift in emphasis from the object to the user, from the producer to the consumer.” Coleman linked the early philosophy and confidence in the power of design to improve the world by design with the values of the current universal design movement.

He also emphasized the collaborative and multidisciplinary work that still characterizes all of their work. “The RCA is a tiny, highly specialized, entirely post-graduate university and it so it was essential to collaborate with other institutions, with manufacturing, retailing and design companies, and with older people’s organizations.”

.The HHRC works with three main groups: RCA students, new graduates, and professional designers. User needs are integral to all of the work. Students are involved through an annual award project, Design for Our Future Selves. Many RCA departments participate in the competition, which has produced elegant designs as well as informative media. Fifteen new graduates are selected by the Centre each year to join the research associates program. HHRC arranges partnerships between the new graduates and industries to develop real-life

projects grounded in user research. Work with professionals includes research, design competitions and seminars.

References:

The HHRC website "http://www.hhrc.rca.ac.uk/"

Coleman, R. “Designing for Our Future Selves.” In Preiser, W.F.E. and Ostroff, E. (Eds.) *Universal Design Handbook*. New York: McGraw-Hill.

USA

A.9: Universal Design Education Project (UDEP)

The Universal Design Education Project (UDEP) was developed by the Adaptive Environments Center in Boston, Massachusetts. It was planned in 1989 when the ADA was about to be signed, providing an opportunity to improve design education and student's ability to meet the needs of a diverse society. The approach was to infuse universal design into the curriculum of five design disciplines – architecture, industrial design, interior design, landscape architecture, and urban planning.

UDEP was initiated with a grant from the National Endowment for the Arts. It took two years before the project had enough funding to actually begin. Other funders included NEC Foundation of America, the US Department of Justice, and the Center for Universal Design and other foundations.

The professional design societies assisted by mailing the Call for Proposals to their membership. It invited faculty to submit proposals based on the culture of their own schools, and their own experience and teaching styles. We called it a grass-root effort to support a range of teaching methods that grew out of the faculty and the school. Inspired by Ray Lifchez's work, the proposal requirements specified the involvement of people with disabilities. Each school had different ways to approach this. The advisory group assisted in the review process to select the schools.

The first pilot project in the academic year 1993-94 was comprised of faculty teams from twenty-two schools across the country. Some were interdisciplinary and others were in architecture, industrial design, interior design, and landscape architecture but there were no proposals from the urban design programs. Many of the faculty selected through the competitive award process had strong experience in teaching accessible design. The initial pilot project is well documented in Strategies for Teaching Universal Design with case studies of twenty-one programs.

There were several project components that supported faculty work. Members of the prestigious advisor group had partnerships with each of the schools. That contact included well publicised visits to the schools, with lectures open to the public, meetings with administrators, and critiques of student work. Another generative element involved presentations by the faculty and project staff at the annual meetings of the related design societies. Annual project meetings facilitated the growing faculty network. Faculty reported that the prestige of their awards was important in gaining more recognition by their colleagues.

The evaluations from the initial group of faculty said that the involvement of diverse users was the most valuable aspect of their teaching. They reported that students said, "I wouldn't design any other way." The second pilot was in 1995-96 and included nine schools. Six of the schools from the first group used their experience to refine their programs. They both expanded the impact by involving more faculty and were able to re-design components.

Educator forums sponsored by UDEP have been held at several international conferences. The program has evolved into an informal network of educators around the world with a monthly online newsletter archived at http://www.universaldesign.net.

Welch and Jones, who were faculty in the second UDEP at the University of Oregon, Eugene, have begun to articulate a process model for incorporating universal design into design education that builds on the UDEP experiences of the past eight years. “To maximize the impact of these strategies a comprehensive approach to content is needed to ensure that students have maximum opportunity for attitudinal change and critical thinking as well as acquisition of process and knowledge. Five components are critical if students are to move from general awareness to engagement and integration, and, ultimately, the ability to design inclusively: 1) learning technical/anthropometric information; 2) learning about user needs research; 3) learning from users involved in the design process; 4) developing self-awareness; and 5) engaging the social, political and ethical issues of inclusive design. Each component is necessary to universal design teaching and has more impact when taught in relation to the others

Faculty from many of the schools have continued to evolve their strategies to infuse universal design. The most infused programs are in the interior design programs, especially at Eastern Michigan University. “Students in this program came to understand that “good design” requires much more than compliance with the minimum requirements of laws that mandate a few special features to create barrier-free environments for individuals with disabilities”. However, there is little evidence of impact in other faculty in schools of architecture. There are 112 accredited architecture programs in the USA, with long-standing and disparate educational traditions. There is still limited attention to user needs. There are continuing debates with little consensus on the degree of ‘practical’ experience that one should have in school and what should be reserved for the internship period There is still confusion about universal design and its relationship to the Americans with Disabilities Act (ADA) Standards for Accessible Design. For many architectural educators and practitioners, universal design is merely a contemporary term for accessibility requirements or a code word for designing for older and disabled people. Since much of what is designed by architects is subject to the ADA, many architects feel that they know all about that. However, there is a growing expression about the lack of diversity in architecture schools and in the profession. Within that context, there may be the potential for productive planning for convergent strategies that will include a universal design approach into the curriculum.

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Welch, P. 2001. “Teaching Universal Design in the U.S.” In Preiser, W.F.E. and Ostroff, E. (Eds.) Universal Design Handbook. New York: McGraw-Hill.

Jones, L. 2001. “Integrating Universal Design into the Interior Design Curriculum.” In Preiser, W.F.E. and Ostroff, E. (Eds.) Universal Design Handbook. New York: McGraw-Hill.

Ostroff, E. 2001. “Universal Design Practice in the United States.” In Preiser, W.F.E. and Ostroff, E. (Eds.) Universal Design Handbook. New York: McGraw-Hill.

A.10: The Department of Architecture, University at Buffalo.

The department of architecture, university at buffalo, has a long and distinguished history in research, education, and practice of accessible design led by professor Edward Steinfeld. Buffalo established their first research centre in 1984, and it became the inclusive design and environmental access (idea) centre in 1992. He and colleague Abir Mullick were part of the group that developed the principles of universal design with the centre for universal design. In 1999, the national institute on disability and rehabilitation research funded a new centre for universal design at buffalo, directed by Steinfeld. Both Steinfeld and Mullick were the lead faculty on the first UDEP project in 1993-94, and the second project in 1995-96. Many of the strategies that they developed with other buffalo colleagues in the UDEP years have been further refined and are now part of the curriculum. They include:

Designing for Diversity, a course offered for the first time in the spring of 2002 as part of the college's core requirements in General Education. The 1996 UDEP panel on Designing for Diversity was instrumental in the creation of the course.

Computer Assisted Instruction (CAI), a computer-based course on the technical aspects of accessible design, was created to meet students' need for more technical comprehension. This need was re-confirmed during the first UDEP. Students can work independently with this material, on their own schedule.

Design for the Life Span is a course that presents an overview of the demographic trends, the major goals and approaches for design and planning of life-span needs, with special attention to children, older adults, and individuals with impairments. The course is offered in traditional and online formats.

Master's Degree Concentration in Inclusive Design prepares students to understand and respond to demographic trends and policy initiatives from both a

theoretical and practical perspective, and to incorporate inclusive design principles with careers in general practice, facilities management and design research. Students selecting this area of concentration work closely with faculty research associates at the IDEA Center.

In addition to completing requirements for the Master of Architecture degree, students opting for the Inclusive Design Concentration must complete one seven credit studio and two three credit electives designated as area concentrations, and undertake a thesis with a focus in inclusive design. Students completing the area requirements are awarded an Inclusive Design Area of Concentration Certificate upon graduation. There are four architecture graduate students enrolled at this time.

Master of Architecture II in Universal Design, a post-professional degree program is scheduled to begin in Fall 2002.

Beth Tauke, Associate Professor, and collaborator in the second UDEP, described the Buffalo programs listed above as well as the key components of universal design education at Buffalo in her paper on Curriculum Models for the Inclusion By Design conference in Montreal, Canada June 2001. Building on the planning to make sustainable design more a mainstream component in architectural curriculum, Tauke defined key issues including:

Universal design requires examination of the issues and challenges of the real world. Studios focusing on universal design, for example, would be more likely to include variables such as materials analyses, ergonomics, wayfinding, sensory information, and construction strategies.

Universal design, too, needs to develop a strong theoretical and research base to encourage scholars and researchers to enter the discipline and to establish the academic legitimacy of the discipline.

More examples of teaching at Buffalo can be found on the new Universal Design Education Online website at

http://www.udeducation.org

a collaborative project with the Center for Universal Design and the Global Universal Design Educator's Network.

References:

The IDEA website, which includes a number of publications, media, and useful links is at http://www.ap.buffalo.edu/idea/

Tauke, B.. 2001. "Curriculum Models Project," and "Design and Diversity: Universal Design in University General Education." Proceedings, Inclusion By Design conference, Montreal, Canada.

Papers Online at:

http://www.inclusionbydesign.com/worldcongress/proceeding.htm

Mullick, A. and Steinfeld, S. (Eds). 1997. Innovation, the Quarterly Journal of the Industrial Designers Society of America, Volume 16, No. 1.

Steinfeld, S. and Tauke, B.. "Universal Designing." In Christophersen, Jon., Ed. Universal Design 17 ways of Thinking and Teaching. Husbanken, Norway, 2002.

USA WEBSITES

A.11 The Global Universal Design Educators Network and its monthly Online News is based at The Universal Design Network, http://www.universaldesign.net

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The Network is a loose coalition of people committed to universal design education.

The website invites participation, provides opportunities for interaction, and connects to the outstanding universal design sites around the world.

The site contains a searchable archive of all the previous issues of the Global Universal Design Educator's Online News, an interactive forum page for discussion, and links to key international universal design resources.

A.12 Universal Design Education Online website

This is a collaborative project with the Center for Universal Design and the Global Universal Design Educator's Network.

The site is designed for use by faculty members, students (of any age and stage), and user/experts. The site supports professional design education as well as continuing education and K-12 education. It features a variety of materials for a range of disciplines, levels, and interests including: instructional materials such as syllabi, course modules, sample assignments, and evaluation methods; content resources such as computer animations and renderings of excellent examples of universal design; full text of classic universal design writings; an annotated bibliography of other available materials; and links to relevant resources.

The interactive site provides online support for educators including a discussion forum and an online journal. The site provides students a listing of universal design programs and courses offered worldwide, and a calendar of events both upcoming and archived.

A.13 The Seven Principles of Universal Design.

The Center for Universal Design is a national research, information, and technical assistance center that evaluates, develops, and promotes universal design in housing, public and commercial facilities, and related products. Its website is found at http://www.design.ncsu.edu/cud/

A working group of architects, product designers, engineers and environmental design researchers, collaborated to establish the following Principles of Universal Design to guide a wide range of design disciplines including environments, products, and communications. These seven principles may be applied to evaluate existing designs, guide the design process and educate both designers and consumers about the characteristics of more usable products and environments.

PRINCIPLE ONE: Equitable Use

The design is useful and marketable to people with diverse abilities.

PRINCIPLE TWO: Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.

PRINCIPLE THREE: Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.

PRINCIPLE FOUR: Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.

PRINCIPLE FIVE: Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.

PRINCIPLE SIX: Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.

PRINCIPLE SEVEN: Size and Space for Approach and Use

Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Guidelines for each of these principles can be found at:
http://www.design.ncsu.edu/cud/univ_design/princ_overview.htm

NORWAY

A.14: The Norwegian Universal Design Education Project.

The Norwegian Government began a far-reaching pilot project in 1997 to address what they saw as a fragmented approach to accessibility. They wanted to change the common practice wherein national policies were implemented at a lower level. This purely technical approach was always “ineffective and poorly coordinated.” Universal design education was a vital part of their approach.

The national project is led by two agencies, the Norwegian Housing Bank (Husbanken) and the Ministry of the Environment, with the involvement of many consumer and other organizations .

In order to elevate accessibility to the necessary stage of master planning they initiated several strategies. One important direction was attention to the development of skills and attitudes in the universities. Another aspect addressed the lack of awareness of user needs, and the need for better methods and outreach for user participation.

They developed a four-year pilot program with universities across the country, adapting the model used by the US Universal Design Education Project. The approach was to offer schools support for their own creative initiatives based on their own identities and community context. The pilot included programs in architecture, interior and industrial design, occupational therapy, engineering, planning and vocational schools.

Over the four years there was a strong shift in the educational approach. It moved from occasional lectures about accessibility based on the difficulties experienced by people with disabilities to a more integrated universal design approach that incorporated accessibility.

The project continues to be evaluated. Some early results noted that faculty believes they are teaching better; they value the involvement of outside users and the improved materials.

One of the projects was at the Norwegian University of Science and Technology at Trondheim, in the city and regional planning program. In one exercise, planning students worked with five user groups to analyse specific parts of the city. The users evaluated solutions to problems. The final exam required that the students discuss the consequences of universal design in city and regional plans.

Another project in the Oslo School of Architecture was involved with a project to redesign an old high school to meet new educational objectives and also provide a public use space through universal design. The students used a highly participatory process and produced the beginning of the plan for the reconstruction.

References:

Bringa, O. 2001. “Norway’s Planning Approach to Implement Universal Design.” In Preiser, W.F.E. and Ostroff, E. (Eds.) Universal Design Handbook. New York: McGraw-Hill.

Editoral and first 3 chapters in “Universal Design 17 ways of Thinking and Teaching.” Christophersen, Jon., Ed. Husbanken, Norway, 2002.

IRELAND

4.15 The DraWare Project.

The European Community funded the DraWare Project at the School of Architecture, University College, Dublin, Ireland. It was a two-year research project, from 1988 to 2000, to experiment with teaching methods that would lead to the creation of a more universally usable environment. It also worked beyond the college, to raise awareness in the profession. The DraWare team was John Olley, Ruth Morrow and Fionnuala Rogerson in cooperation with the design tutors in the school of architecture. The project organisers were sensitive to the resistance to change in an educational system and understood that the traditional methods of teaching reflected values that were different from their own.

Although the relationship between people and space seems fundamental to the practice of architecture, there were at this time few explicit requirements in the RIBA/ ARB validation criteria for the curriculum in architectural schools. The project worked to reconnect the students to deeper understanding of the end

user, and worked across the whole architectural program to help students recognize the dangers of designing for the abstract and stereotypical user. Ruth Morrow noted that the principals of universal design were incorporated into lectures, history/theory seminars and design studios.

Not only did the DraWare project provide much deeper awareness of the users, it fostered much better interactions between students. The project used multiple strategies to imbed and infuse an interactive learning process across the curriculum. Real-world problems were addressed in concert with individuals and organisations in the community.

References:

Morrow, R. 2001. “Inclusion as a Critical Tool in Design Education.” In Preiser, W.F.E. and Ostroff, E. (Eds.) Universal Design Handbook. New York: McGraw-Hill.

Examples of student projects can also be seen in Morrow’s discussion of the DraWare program on the Universal Design Education Online site at http://www.udeducation.org

The DraWare website is also maintained at

http://avc.ucd.ie/DraWare

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DENMARK

4.16: The AAOutils Design for All Project

This is a pan-european project based in Belgium, Denmark, France and Poland.

The main objective of the Aaoutils project is to design innovative teaching tools based on the concept of architecture accessible to all (and thus also to handicapped or people or people with limited mobility) in an extension of the spirit of “Design for All”. Using these tools, training schemes can be implemented both at nationwide and at the European level. The Project is targeted initially at Architectural students, Practising architects, in the context of ongoing training and Architectural teachers.

The Project is a 2 year project and will finish June 2003.

The Project Website can be found at

http://anlh.be/aaoutils

JAPAN

A.17: NEC Corporation Collaboration with Tama Art University

The four-year collaboration between NEC, a large Japanese electronics company and Tama Art University was inspired by Japan's rapidly aging society and the need to design usable and appealing products. It achieved important results for the company and for the university. The company developed a universal design process for products and the university had a revised curriculum for all four years of their industrial design program. One of the products resulting from the course was a public information terminal for an amusement park. The terminal with its adjustable display and user-friendly interface was one of the commercial products developed thorough the collaboration.

When the project began in 1996, experience centred workshops provided the first introduction to the needs of diverse users, through active participation with older and disabled people. Guidance and evaluations by NEC engineering professionals gave feedback from the high tech production side; feedback from the users helped students reassess their design concepts, with concrete ideas for improvement. The project demonstrates an interest in long-term commercial benefits. These benefits coincided with the new US law, section 508 that requires universal design of electronic and information technology purchased by federal agencies. This was a powerful incentive to convince top management of the consequences of NOT designing universally.

Observation as well as involvement with the target users was an essential part of the project. This slide has four images. In the upper right an older woman, a little stooped in her posture, is observed as she opens a door to a store. In the top centre, a group of students and company staff are listening to a blind man explain his interactions with the environment. In the bottom centre, two older women are sitting down, completing a questionnaire. In the lower left, a tall man is observed as he figures out the directions to assemble a large cardboard package.

Chitose Ikeda and Noriko Tanganyika have carefully documented this project through reports as well as a book chapter.

References:

Ikeda, C., N. Takayanagi. 2001. “Universal Design Collaboration Between Industry and a University.” In Preiser, W.F.E. and Ostroff, E. (Eds.) Universal Design Handbook. New York: McGraw-Hill.

CANADA

These two Canadian examples differ from others that are discussed in this paper. Both projects were developed to educate people who were not studying to become designers. The Sheridan College project is from a program for architectural technologists who are key people in the building trades and the University of Manitoba program trained people with disabilities to become access consultants.

A.18 Sheridan College, Teaching Architectural Technologists

Bob Topping is an architect who teaches a universal design course within the Architectural Technology program at Sheridan College, a community college near Toronto, Ontario. He explains a little about the architectural technology course. “Students do a three-year diploma program, and they focus on the construction side of the whole design and construction process, rather than the design side. They’re used in many places to support the design process, the drawing development process, and the construction process.” They play a vital role in turning design ideas into practical, workable buildings and he believes that architectural technologists are another important profession to influence in order to advance the universal design agenda.

Topping uses an unusual approach to help the students fully appreciate the Seven Principles of Universal Design. It is a module called the ‘Seven Deadly Sins” and it can be found on the Universal Design Education Online website.

Here is part of his assignment:

> “Working individually, or in teams of two, your challenge is to design one of the following spaces.
>
> A 'big box' retail store, similar is size and scale to a Business Depot or Future Shop;
>
> A church or similar place of worship, capable of seating 200 people; or
>
> A restaurant, capable of seating 100 people.
>
> Choose any site you like, but a real site must be chosen (the presentation must include some site context). The catch is, you must use your design

to exclude as many people as possible from using your building. Your goal is to not comply with as many of the seven universal design principles as possible".

He says, "The project was assigned to students enrolled in the third year of the architectural technology program. The project was strategically placed as the penultimate assignment for the course – a chance to have some fun before the final (heavily weighted and important!) assignment. Prior to the commencement of this project, students had studied the principles of universal design and had researched and critiqued examples of the successful application of universal design…They seemed to better understand the basis of each principle and how to apply within the design process.

The involvement of a diverse user group was a key element in the project. Although I was very nervous about the reaction of the user group to some of the more radical design ideas (e.g. the only access into the building was via a ladder!), the group was not offended and had lots of fun."

References:

Topping, B. "The Seven Deadly Sins." At

http://www.uneducation.org

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A.19: Universal Design Institute, University of Manitoba

The Universal Design Institute (UDI) at the University of Manitoba has a long history of user-centered involvement. It was formerly the Canadian Institute for Barrier Free Design.

The UDI led a course to train consumers who wanted to become consultants. It was offered in seven locations across Canada. The Manitoba League of Persons with Disabilities and the Canadian Human Resources Development Fund underwrote the course. The curriculum was developed in consultation with the instructors, Betty Dion and Gail Finkel, two universal design researchers and advocates in Canada.

Two of the graduates of the course were hired by the city of Winnipeg as consultants on a streetscaping project; the slide shows both of them taking measurements in a walkway in front of a large building.

The Winnipeg project was extremely participatory. The process involved the disabled consultants along with a diverse group of stakeholders including older people, street kids, the policy makers, building code officials, and designers. The user involvement process is more fully detailed in Ringaert's chapter User-Expert Involvement in Universal Design

Laurie Ringaert, former UDI Director, also taught a multidisciplinary graduate course in the Faculty of Architecture at the University. The course, Introduction to Universal Design, involved staff from the UDI and other people with disabilities in the teaching and learning. The course has extensive real world experience; a team project with the town of Ashern to redevelop an abandoned street, was a first place winner in the 2001 Canadian Design Exchange universal design competition. The Ashern Redevelopment Project was on display with other winners at the Inclusion by Design conference in Montreal, 2001.

References:

Ringaert, L. 2001. “User-Expert Involvement in Universal Design.” In Preiser, W.F.E. and Ostroff, E. (Eds.) Universal Design Handbook. New York: McGraw-Hill.

Appendix B

1. Council of Europe Resolution Definition:

Universal design is a strategy, which aims to make the design and composition of different environments and products accessible and understandable to, as well as usable by, everyone, to the greatest extent in the most independent and natural manner possible, without the need for adaptation or specialised design solutions.

The intent of the universal design concept is to simplify life for everyone by making the built environment, products, and communications equally accessible, usable and understandable at little or no extra cost. The universal design concept promotes a shift to more emphasis on user-centred design by following a holistic approach and aiming to accommodate the needs of people of all ages, sizes and abilities, including the changes that people experience over their lifespan. Consequently, universal design is a concept that extends beyond the issues of mere accessibility of buildings for people with disabilities and should become an integrated part of architecture, design and planning of the environment.

2. Adaptive Environments definition taken from the Website :

Universal design is a worldwide movement based on the concept that all products, environments and communications should be designed to consider the needs of the widest possible array of users. It is also known around the world as design for all, inclusive design, lifespan design.

- Universal design is a way of thinking about design that is based on the following premises:
- Varying ability is not a special condition of the few but a common characteristic of being human and we change physically and intellectually throughout our lives;
- If a design works well for people with disabilities, it works better for everyone;

- At any point in our lives, personal self-esteem, identity, and well-being are deeply affected by our ability to function in our physical surroundings with a sense of comfort, independence and control.'(Leslie Kanes Weisman, 4/99)
- Usability and aesthetics are mutually compatible.

Universal design asks from the outset how to make the design work beautifully and seamlessly for as many people as possible. It seeks to consider the breadth of human diversity across the lifespan to create design solutions that work for all users.

3. Center of Universal Design Definition taken from the Website.

Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

The intent of universal design is to simplify life for everyone by making products, communications, and the built environment more usable by as many people as possible at little or no extra cost. Universal design benefits people of all ages and abilities.

4. Definition taken from the Disability Rights Commission Publication 'Inclusive design: products that are easy for everybody to use'

Inclusive Design: The basic idea is very simple. It is that products and services should be designed to be easily usable by as many people as possible. In particular inlcusiveinclusive design aims to meet the needs of people who have been unable to use mainstream products because of age or disability.

Appendix C: Cost versus Value

example one:

The BT (formerly British Telecom) Big Button phone designed to accommodate the needs of elderly people and people with visual impairment has far outsold any other BT product and the company's own expectations.

example two:

from Fionnuala Rogerson, DraWare Project.

A small scheme of 18 houses for a Housing Association in County Carlow, Ireland were initially designed to some degree to Lifetime Homes Criteria – level covered entrances, low window cills, easy access to controls, a ground floor bedroom in all two storey houses, and a small ground floor wc. In order to cut costs after tenders had been received, all ground floor wc's and their associated drainage were omitted from six 2 storey houses. The total net saving for the 6 wc's was £1,650. One month before practical completion the tenancies were allocated and one family had a disabled child necessitating the reinstatement of the same small wc on the ground floor. This time the cost was £3,700. This one toilet cost more than twice the total cost of 6 toilets, had they been installed at the outset.

example three:

B&Q and FIAT have actively implemented inclusive design policies to increase their profitability

example four:

Lifetime Home Costs. The Joseph Rowntree Trust has down extensive work on calcualting the implied cost and longterm value of life time housing. References for this work are:

Designing Lifetime Homes, edited by Julie Brewerton and David Darton

Costing Lifetimes Homes by Kim Sangster

A cost-benefit analysis of Lifetime Homes by Christopher Cobbold

Residents' perception of Lifetime Homes by David Bonnett and Nicholas Walliman,

References

Adams, Maurianne., Bell, Lee Anne., Griffin, Pat. 1997 “Teaching for Diversity and Social Justice. A Sourcebook.” Routledge, New York.

Aldersey-Williams, H. B., John., Coleman, Roger. (eds). 1999. “The Methods Lab. User Research for Design.” London, Design for Ageing Network for the Presence Conference held at the Royal Geographical Society.

Brewerton and Darton, 1997 “Designing Lifetime Homes”, Joseph Rowntree Foundation

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French, S. 1996 “Simulation exercises in disability awareness training: a critique.” In “Beyond Disability. Towards an Enabling Society” (Ed, Hales, G.) SAGE publications and Open University, London.

Froyen, Hubert, 2002. “Universal Design Education; Introduction.” Paper given at Universal Design Education Scientific Forum, Brussels, May 17, 2002

The Knowledge Map: This Knowledge Map is a tool to search a database of references of accessibility guidance for the built environment. Each guidance document is summarised to help you decide whether it will be useful for you. In addition each document has been rated to indicate the level of 'inclusivity' of the guidance given, that is, the extent to which it meets the needs of all potential users of an environment rather than a specific user group. It can be found at the DPTAC website : http://www.dptac.gov.uk/

Lebbon,C., and Morrow, R. 2002 “Obstacles and Solutions to Inclusive Design Paper for Design Management Institute” 11th International Forum on Design Management, Research and Education

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Manley, S. 1998. "Designing a Paradigm Shift in Education and Practice". In Designing for the 21st Century: An International Conference on Universal Design of Information, Products and Environments. NC State University, The Center for Universal Design.

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Ostroff, Elaine. 2002. “Strategies for Teaching and Recruiting Designers for an Inclusive World”, Paper given at the Scientific Contact Forum, Brussels, Belgium. May 17, 2002

Andrew Shipley. 2002 “What is Inclusive Design and how can it achieve a built environment to be enjoyed by everyone?”. Discussion Report arising from the November 2001, Disability Rights Commissions Round Table Discussion on Inclusive Design

Steinfeld, E., Tauke, Beth 2002. “Universal Designing.” In “Universal Design. 17 ways of thinking and teaching.” J. Christopherson, Husbanken.

Look at http://www.trace.wisc.edu/world/gen_ud.html TRACE Website for extensive References & Resources on Universal Design.

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